35

$r = 13$ in

$\theta = 200 \cdot 2\pi = 400\pi$

$t = 1$ min

$$V = \frac{r\theta}{t} \Rightarrow V = \frac{13 \cdot 400\pi}{1 \text{ min}} = \frac{5200\pi \text{ in}}{1 \text{ min}}$$

$$\frac{5200\pi}{1 \text{ min}} \text{ in} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} = \frac{5200\pi \cdot 60}{12 \cdot 5280}$$

≈ 15.5 miles/hr

(39)

$r = 12.96\text{ cm}$

$t = 18\text{ sec.}$

$s = 56\text{ cm}$

$\omega = ?$

$s = r\theta$

$\omega = \frac{\theta}{t}$

$s = r\omega t$

$56 = 12.96 \cdot \omega \cdot 18$

$\omega = 56 \div 12.96 \div 18$

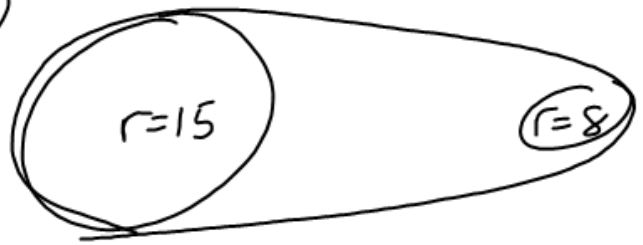
(a) $\omega \approx 0.24\text{ rad/sec.}$

(b) $v = r\omega$ $\quad v = \frac{s}{t}$

$v = \frac{56\text{ cm}}{18\text{ sec}} = \frac{28}{9}\text{ cm/sec}$

$\approx 3.11\text{ cm/sec.}$

40



rotate
rotations
revolutions
revolves

$* \ 2\pi = \theta$ in radians

Lg

$r = 15$

$\theta = 25 \cdot 2\pi = 50\pi$ radians

$t = 36$

$\omega = \frac{50\pi}{36} = \frac{25\pi}{18}$ rad/sec

≈ 4.36

Sm

$r = 8$

$t = 36$

$s = 750\pi$

$s = r\omega t$

$750\pi = 8 \cdot \omega \cdot 36$

$\omega = 750\pi \div 8 \div 36$

$\omega = \frac{125}{48}\pi \approx 8.18$ rad/sec

$s = r\theta$

$s = 15 \cdot 50\pi$

$s = 750\pi$ cm

(43)

$\theta = 5000 \cdot 2\pi = 10{,}000\pi$

$t = 60 \text{ sec}$

$\omega = \frac{\theta}{t} \Rightarrow \frac{10{,}000\pi}{60} = \frac{500\pi}{3} \text{ rad/sec}$

$\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$

$\cos(\pi) = -1$

$\sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$\cos\left(\frac{7\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$\cos\left(\pi/4\right) = \frac{\sqrt{2}}{2}$

$\sin\left(\frac{3\pi}{2}\right) = -1$

$\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$

$\sin\left(\frac{5\pi}{6}\right) = \frac{1}{2}$

$\sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$\cos\left(\frac{\pi}{2}\right) = 0$

$\frac{\pi}{6} = 30$

$\frac{\pi}{4} = 45$

$\frac{\pi}{3} = 60$

$\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$

$\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$

$\sin\left(\frac{7\pi}{6}\right) = -\frac{1}{2}$

$\sin\left(\frac{\pi}{2}\right) = 1$

$\cos(\pi) = -1$

$\sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$\cos\left(\frac{5\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

$\cos\left(\frac{2\pi}{3}\right) = -\frac{1}{2}$

$\sin\left(\frac{3\pi}{2}\right) = -1$

$\sin\left(\frac{5\pi}{6}\right) = \frac{1}{2}$

Ch. 3 Test

- Convert between radians + degrees
- Arc length $s = r\theta$
- Linear / Angular velocity

  $v = \frac{s}{t}$, $v = \frac{r\theta}{t}$, $v = r\omega$, $\omega = \frac{\theta}{t}$, $s = r\omega t$

- Application problems
- Unit circle (recreate) - Angles + coordinates p. 109
- Speed test

Review Problems p. 124 #5, 7, 11, 13, 19, 21, 47, 59-62

Redo Sect 3.2 # 18-23

Sect. 3.4 # 35, 39-43